SuperMOCA Report & Demonstration

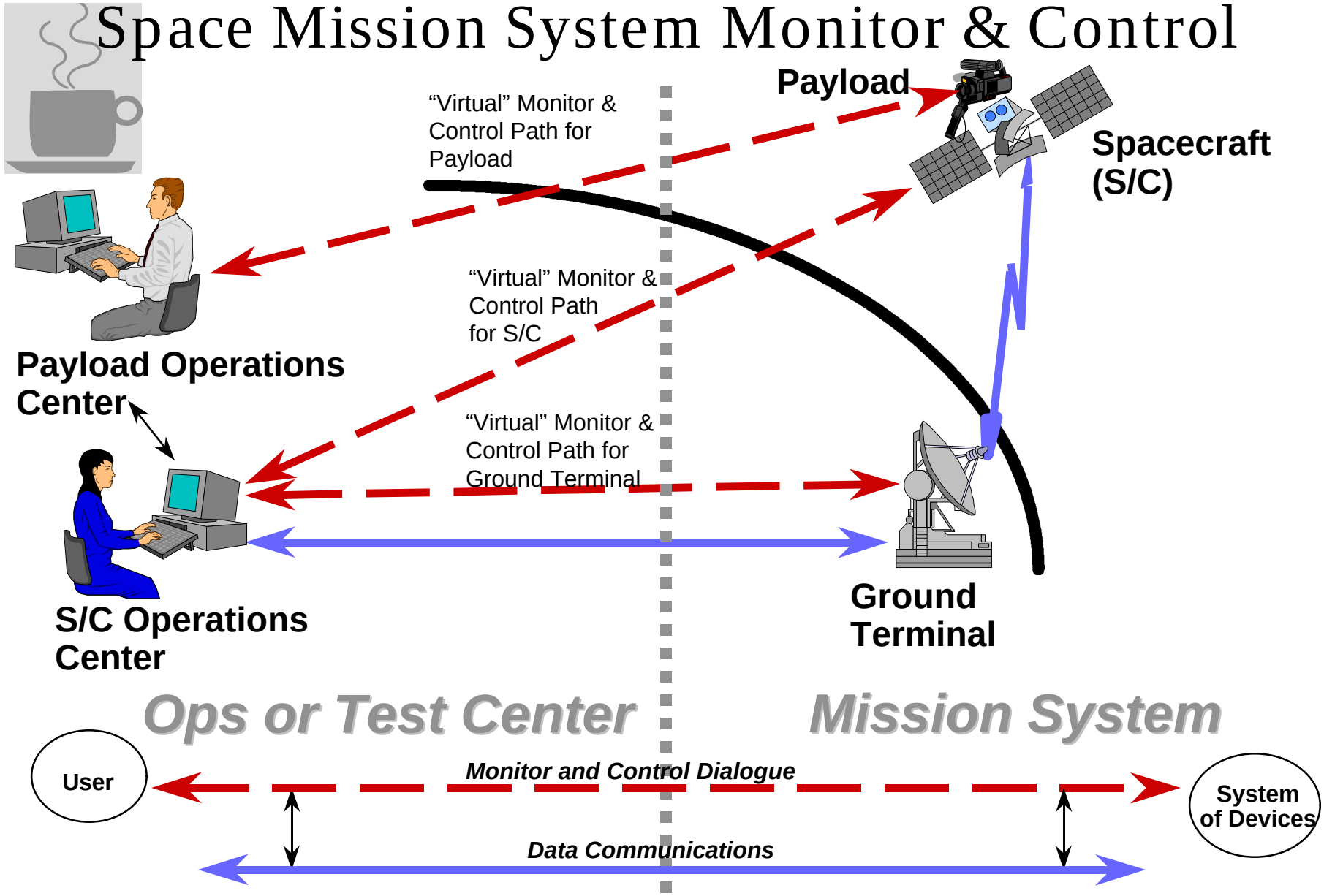
M. K. Jones
michael.k.jones@jpl.nasa.gov
818-354-3918

May 1998

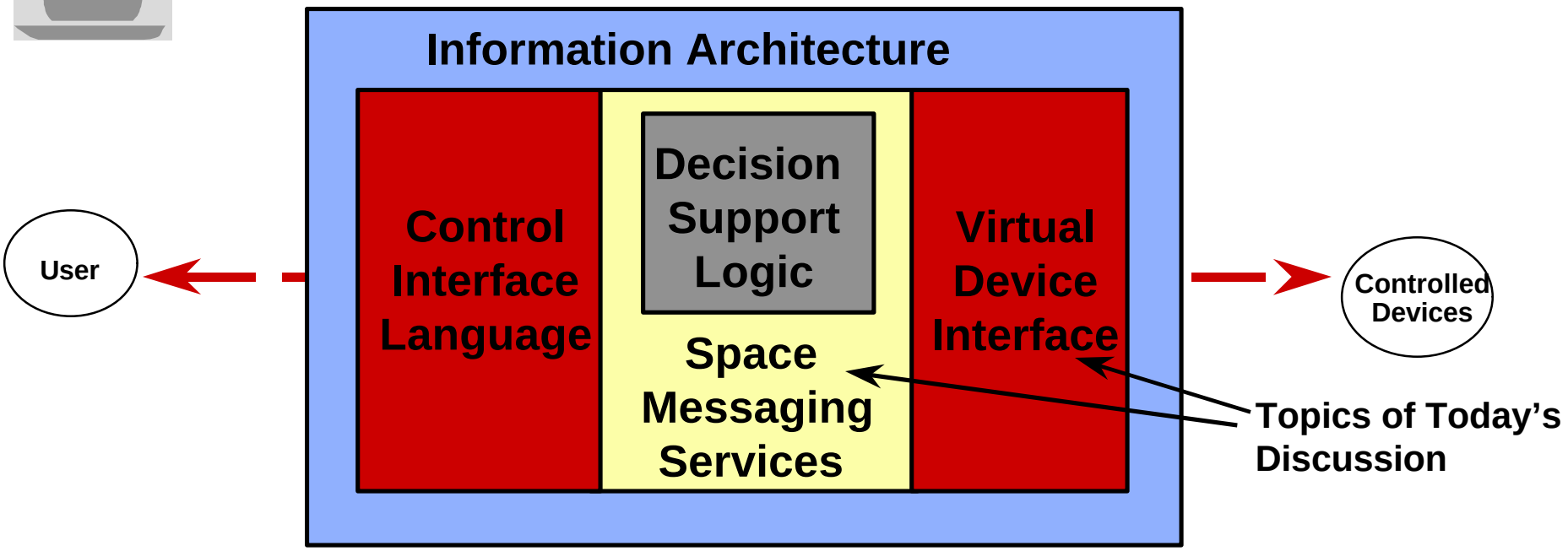
Agenda

- Space Project Mission Operations Control Architecture (SuperMOCA) Overview
- Status
- Messaging Systems and Virtual Devices
- Demonstration

Space Mission System Monitor & Control



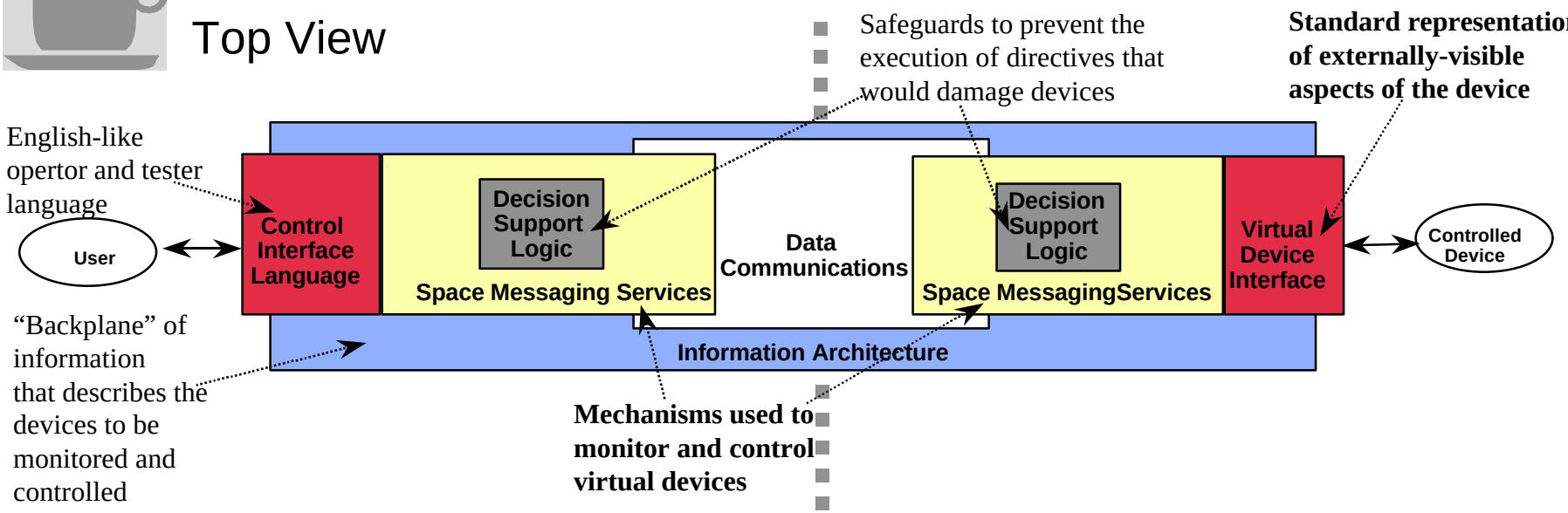
SuperMOCA: An Architecture and Standards for Space Mission System Monitor & Control



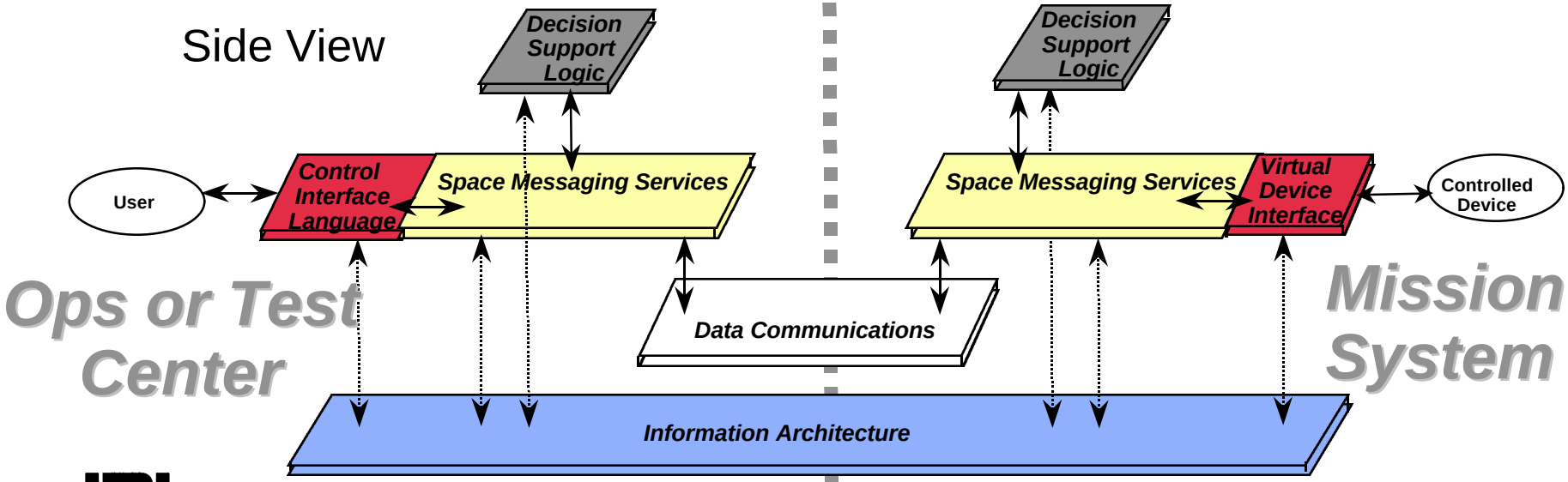
- An architecture for the monitor and control during integration, test, and operations of:
  - spacecraft and launch vehicles
  - launch complexes and ground tracking stations
- A set of open standards that are consistent with the above architecture and apply to the devices used in space missions and the products used to monitor and control those devices.

Key Features: Open Standards and Layering

Top View

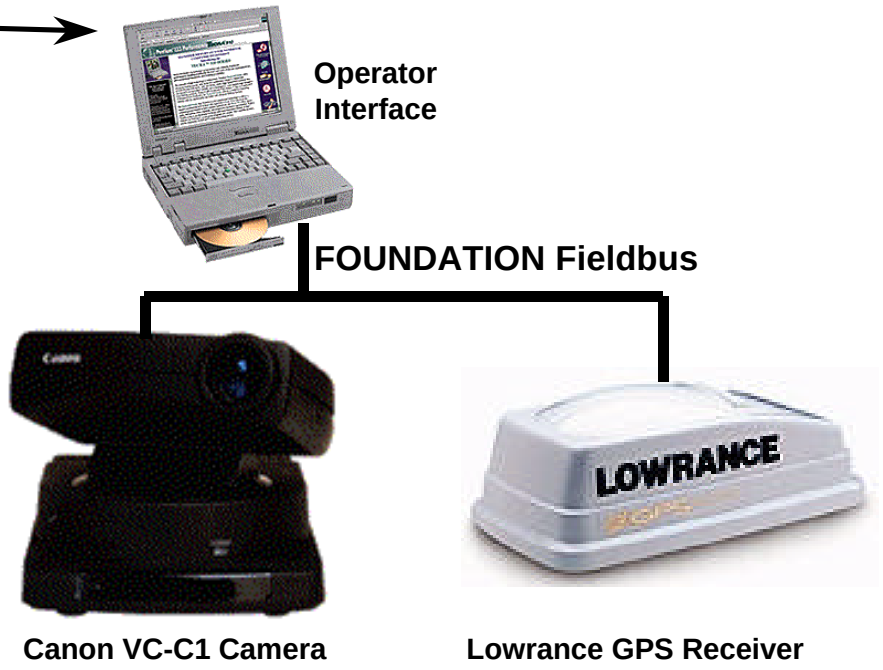


Side View



Status of Space Project Mission Operations Control Architecture (SuperMOCA) Task

- Overview Documents Available
  - Summary - Why SuperMOCA is important
  - Architecture - What SuperMOCA is
  - Operations Concept - How SuperMOCA is applied
- Current Focus is on messaging services and virtual devices
- Road Show Demo
  - Commercial messaging system
  - ISA Show in Anaheim in Oct. 97
- JPL Demo
  - Commercial messaging system
  - Simulated S/C



SuperMOCA Homepage

- You can find it at:
  http://supermoca.jpl.nasa.gov/supermoca

- You can access:
  - News & Announcements
  - Papers
  - Documents
  - Explanation of Demos
  - Points of Contact
  - Status Reports
  - Links to Related Home Pages

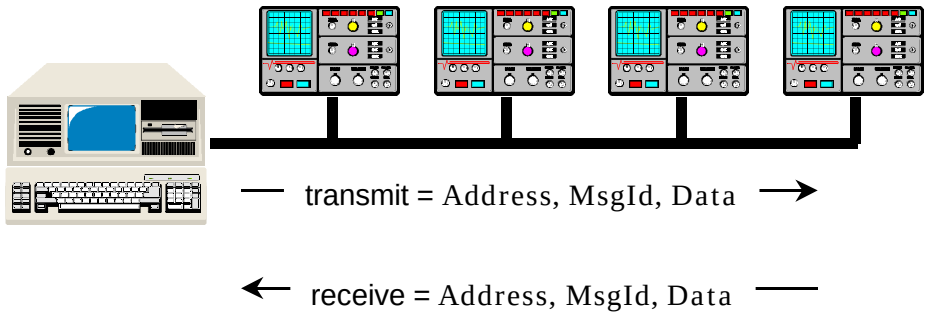
What is a messaging service?

- Any set of services that support the exchange of data between two (or more) systems or devices. It can include capabilities to:
  - Define message types
  - Define message structures
  - Define procedures for and roles of participants in service protocol

    Who initiates communications, responses, error handling, priority, etc.

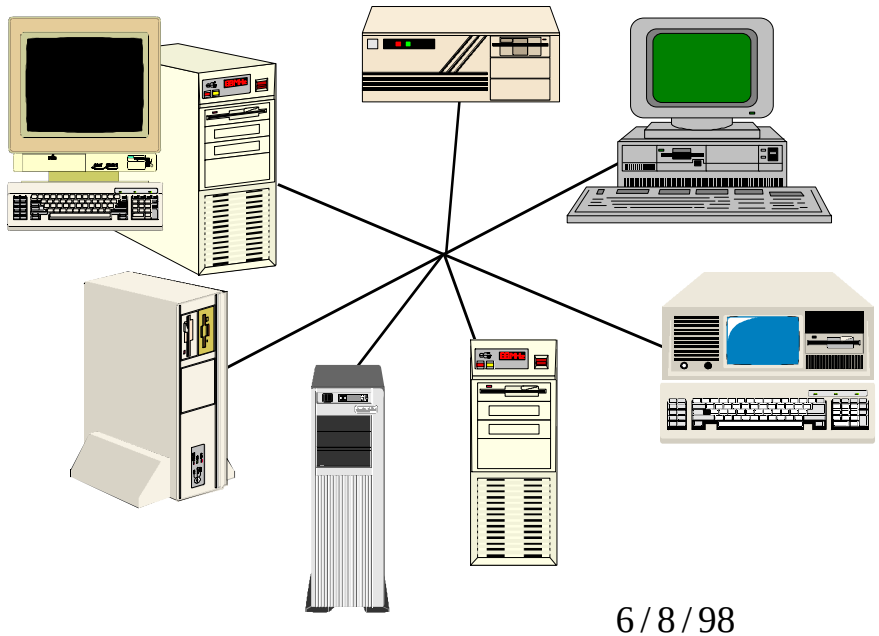
Simple Messaging Services in Automation

- Provides transmit & receive services using an message identifier
- Provides addressing to support communication with multiple devices on a single network
- Protocols for services are performed by the applications



Sophisticated Messaging Services in Automation

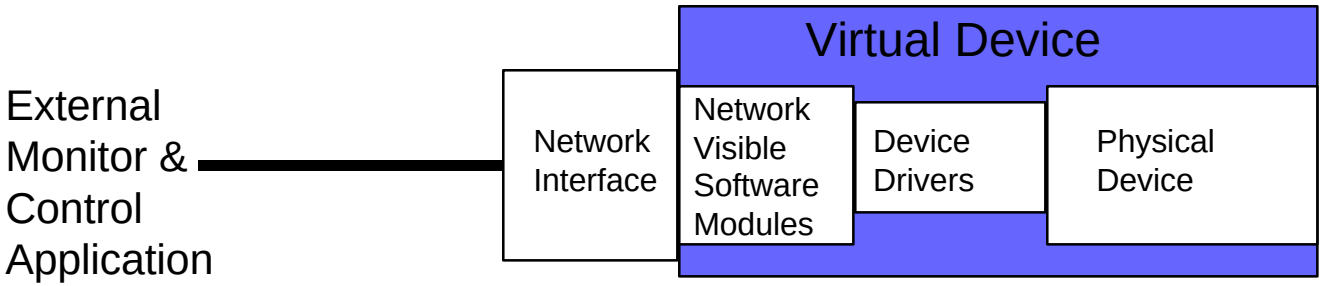
- Provides a large set of services
- Provides many options for data structures in message
- Provides addressing for large systems over multiple networks
- Performs the protocols that execute the service interactions



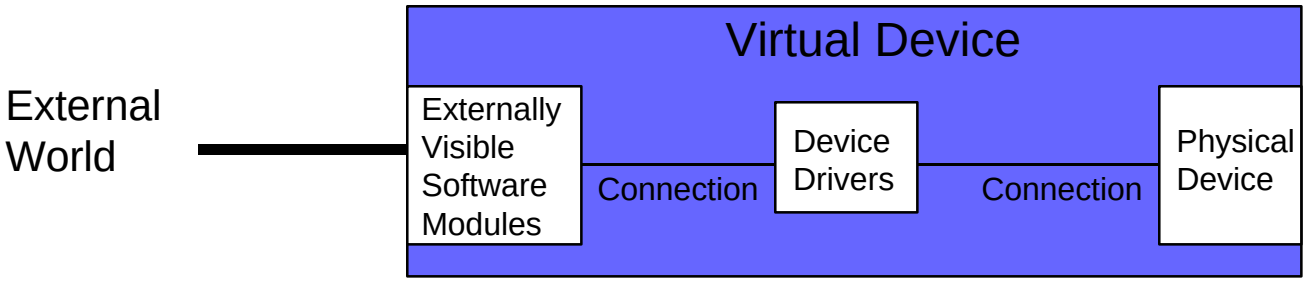
Virtual Devices in Automation

What is a virtual device?

- A collection of one or more software modules with a given device that allows any entity that is external to that device to monitor and control one or more aspects of the device's functionality
- The network-visible representation of the aspects and behavior of a given device



- A representation of the externally-visible aspects of a given device that can be monitored or controlled



Messaging Services and Virtual Devices in the Road Show Demonstration

- Virtual devices consist of the "objects" that represent the externally-visible aspects of the device
- Messaging services provide the capabilities to monitor and control the device through manipulation of the "objects"
- Fieldbus Messaging Service (FMS) is an example of an integrated architecture with which to build a monitor and control system
  - set of messaging services
  - set of virtual device "function blocks"